REMARKS/ARGUMENTS

Prior to this amendment, claims 1, 3-8, 10-15, 17-21, 23 and 24 were pending in this application. By this amendment, claims 2, 8, 11-14, 16, 22 and 25 are canceled and new claims 26-33 are submitted; accordingly claims 1, 3-7, 10, 15, 17-21, 23, 24 and 26-33 are now presented for examination and allowance.

No new matter has been added; support for the amendments to the claims is found throughout the application, for example in paragraphs 0013, 0030, 0031, 0039, and 0040.

Amendments to the claims

The subject matter of claim 8 has been inserted into claim 1; accordingly claim 8 has been canceled. Furthermore, claims 10-14, previously dependent upon claim 8 have also been canceled because as a result of this amendment they now include the same limitations as other claims depending from claim 1, as amended, and therefore have become unnecessary.

Generally, the claims have been amended to clarify the inventive concept.

The term "positioning signal" has been added to claim sets based upon independent claims 1, 15, 21, and 24. The term "positioning signal" is used to designate a wireless signal transmitted from a known location (e.g., an SV or a base station) to a mobile station, and whose time of arrival at the mobile station is used to aid in position location, regardless of platform. In the specification, the positioning signal is variously referred to as "SV signal", "GPS signal", or just "signal".

Rejections under §103

In the outstanding office action, claims 1, 3-8, 10-15, 17-21, 23 and 24 were rejected under 35 U.S.C. §103 as being unpatentable over Harrison et al. (US 5,752,218) in view of Gronemeyer (US 6,304,216).

Applicant has amended the claims to make the inventive concept more clear, and respectfully traverses this ground of rejection as to the amended claims. Particularly, applicant contends that Harrison, either alone or in combination with Gronemeyer, fails to teach or suggest every claim limitation.

The amendments to the claims clarify that the time difference is transmitted to the mobile station, and also clarify use of the time difference to reduce code phase search space in the mobile station. As pointed out in the specification [0040], the time difference can be useful even

in systems where no timing reference is available at the client or where no common time reference is available between the client and the server.

The specification provides support for the amendments to the claims, and illustrates its significance. For the examiner's convenience, some relevant sections are reproduced below:

> **[0039]** In the client-server architecture of the invention as shown in FIG. 2, the central server has its own GPS receiver that knows exactly where the satellites are in the sky, the frequencies of those satellites and the timing differences between the satellites and the server, among other information. The server may send information to the client identifying the satellites in view so that the client does not have to search for every satellite but rather only for the satellites for which the client has a reasonable chance of receiving signals. For example, the server may forward information relating to the code sequences corresponding to the SVs in view (e.g. the sequences themselves, or one or more indices into a predetermined table of code sequences). The server may also send the Doppler frequency information of the satellites to the client. *Additionally, the server may send the timing of the satellites (e.g. one or more time differences between code phases) to the client.* It may be desirable for the server to transmit these three kinds of information in the order in which they are presented above.
>
> **[0040]** Accordingly, the acquisition search space or time for a GPS receiver in a client is significantly reduced in the invention. *In a wireless GPS client-server architecture according to an embodiment of the invention, transmission of the relative timing of the satellites by the server may reduce the search space for the client even in cases where no timing reference is available at the client or where no common time reference is available between the client and the server.*
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> [specification, paragraphs 0039 and 0040, italics added for emphasis]

Harrison does not teach the features as claimed. Particularly, Harrison fails to disclose the features relating to transmitting a time difference, and reducing the search space for the code phase of a second positioning signal based at least in part on the time difference.

Instead, Harrison discloses the following:

> 1. *Phases μ_1 through μ_5 are measured along with their corresponding satellite numbers and these data are sent to the central station.* The measured phases can be code word phases in the simplest receiver, or data-bit phases in a slightly more complex receiver. Bit phase could be specified as code word phase plus an integer number of code words offset from the bit transition.
>
> [Harrison, column 10, lines 42-48, italics added for emphasis]

As further discussed in Harrison (column 8, line 66 to column 9, line 5), the phases are transmitted to the central station and the propagation time difference between the satellite signals are calculated at the central station (e.g., using Eq. 10). However, this time difference is not transmitted to the mobile station, nor would there be any reason to do so. As further discussed in Harrison, the central station uses T^C as "the common code period at all transmitters" which is known at the central station to determine the propagation time difference and ultimately the position of the railcar. Therefore, the central station only needs to receive the phases at the railcar to make the position determination as taught by the applied reference. Accordingly, it is respectfully submitted that Harrison does not teach or suggest the feature of transmitting the time difference to the mobile station, nor does it teach or suggest as recited in the claims, and there would be no reason to modify Harrison to transmit the time difference.

Furthermore, the Harrison reference fails to teach determining the code phase of the second signal based at least in part on this time difference as this information is not available. We believe this aspect further emphasizes the difference between Harrison and the present invention in that the applied reference clearly fails to teach using the time difference between the code phases to aid in determining the code phase of the second signal because this information is not supplied from the railcar.

Gronemeyer relates to combining segments of samples separated in time to achieve a greater signal to noise ratio of a GPS signal. Gronemeyer addresses the problem of improving reception of a first signal by combining segments, but does not address the problem of how to reduce the time finding a second signal, and therefore does not address the problem addressed by the claimed invention, nor does it disclose the invention claimed herein.

Therefore the references, taken separately or in combination, do not fairly teach or suggest applicant's claimed invention.

In view of the foregoing, applicant respectfully requests withdrawal of the rejection under §103.

New claims

Applicant submits herewith new dependent claims 26-33. No new matter has been added; support is in the previous claims and specification.

CONCLUSION

The applicant has addressed all of the Examiner's rejections and/or objections as expressed in the outstanding office action, and accordingly applicant respectfully requests that a timely Notice of Allowance be issued in this case.

If the Examiner finds any remaining impediment to the prompt allowance of these claims that could be clarified with a telephone conference, the Examiner is respectfully requested to initiate the same with the undersigned.

In the event that additional fees are required or credit is due or an extension is required, authorization is hereby given to charge Deposit Acct. No. 17-0026.

Respectfully submitted,
QUALCOMM, Inc.

Dated: January 18, 2007 By: /James D. McFarland/

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